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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/510,137

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Gerhard Moeckl

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EXAMINER

LEADER, WILLIAM T

ART UNIT

PAPER NUMBER

1795

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DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/510,137	<b>Applicant(s)</b> MOECKL, GERHARD	
	<b>Examiner</b> WILLIAM T. LEADER	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 14-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/04/04; 03/08/05</u> .                                      | 6) <input type="checkbox"/> Other: ____.                          |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 14 recites the limitation "the medium" in line 5. There is insufficient antecedent basis for this limitation in the claim. Claims 15-27 depend directly or indirectly from claim 14 and are rejected for the reason set forth with respect to claim 14.

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 14 and 16-27 rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a medium which is an electrolyte solution, does not reasonably provide enablement for other media. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. Claim 15 recites that the medium of claim 14 is an electrolytic solution. Based on applicant's specification, it does not appear that the electrochemical processing recited in claim 14 can be conducted in the absence of an electrolyte solution.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 14, 15, 16, 18, 19 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Frembgen (US 5,225,053).

7. The Frembgen patent is directed to a method for regulating the current in an electrochemical process. In the process of Frembgen the electrical current flow between a tool and a workpiece across a working gap through which an electrolyte solution flows is controlled. The workpiece is connected to a variable dc current source as an anode and the tool is connected as a cathode. As the process of removing material from the workpiece is performed, the size of the working gap increases and the gap voltage is increasingly raised. See column 1, lines 6-14. This corresponds to the first step of applying a voltage recited in applicant's claim 1. Frembgen discloses that it is known to operate a machining process using constant operating current. With constant current regulation, the gap voltage between the workpiece and the tool increases approximately linearly with increasing gap width (column 1, lines 30-40). A linear increase in voltage is a ramp. This voltage increase is further described at column 4, lines 4-16 and illustrated in figure 4. The current remains constant at 240A while the voltage increases linearly from 12 V to 18 V. This linear increase corresponds to the step of increasing the voltage recited in instant claim 1. At column 4, lines 52-62 Frembgen discloses measuring the voltage drop at a dropping resistor 48 in the operating circuit 50 of a variable current source 52. Since by Ohm's Law,  $E = I \times R$  where E is voltage, I is current and R is resistance, the voltage drop across the dropping resistor is a measure of the current flowing (i.e.,  $I = E / R$ ). This corresponds to the

step of monitoring recited in applicant's claim 1. All steps in instant claim 1 are disclosed by Frembgen.

8. With respect to claim 15, as noted above Frembgen discloses the use of an electrolyte solution.

9. With respect to claims 16 and 18, the ramp of Frembgen includes a succession of values from 12 to 18 volts. When a first predetermined value within this range is reached, the ramp increases to a higher value. An essentially constant current is obtained.

10. With respect to claim 19, Frembgen discloses that the voltage drop across the dropping resistor 48 is digitized, and the digitized values are compared with corresponding given values in a comparator 56 whose output drives current source 52 so that the voltage continuously increases and the current remains constant (column 4, lines 52-62). In controlling the voltage based on the output of the comparator so that the current remains constant, there is implicitly a control range around the given values with upper and lower values.

11. With respect to claim 24, figure 1 shows that ring electrode 116 is designed to be stationary during processing. As noted above, as the process is carried out and material removed, the working gap increases.

### ***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Frembgen (US 5,225,053) in view of Yahalom et al (US 2003/0155255).

14. The Frembgen patent is interpreted and applied as above. Claim 17 recites that the voltage is lowered via a ramp. The Yahalom et al patent is directed to an electrochemical process in which material is removed from a workpiece by electropolishing. The process employs a controller, connected to a power supply system, which is adapted to provide a first set of electropolishing conditions and subsequently to provide a second set of electropolishing conditions. See the abstract. As shown in figure 3, changing from the first set to the second set of conditions may include decreasing potential (voltage). As shown in figure 4A and discussed in paragraph [0042], the parameters may be ramped down from first to second values. The prior art of record is indicative of the level of skill of one of ordinary skill in the art. It would have been obvious at the time the invention was made to have ramped the voltage down in the process of Frembgen as shown by Yahalom because this is an effective method of changing voltage and may be utilized in situations such as when the method requires reduced processing speed so as to provide increased control near the end of a process.

15. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Frembgen (US 5,225,053) in view of Hey et al (US 6,551,488) or England (US 5,004,528).

16. Claim 20 recites stopping the process if measured current is outside a predefined range. The Hay et al patent is directed to the electrochemical treatment of a workpiece by electroplating. Power is directed to the workpiece from the power supply through contact ring

466 shown in figure 7. Although the contact ring is designed resist deposit buildup, over multiple electroplating cycles interface resistance may increase. An electronic sensor/alarm 704 is connected across the external resistor 700 to monitor the voltage/current across the external resistor to address this problem. If the voltage/current across the external resistor falls outside of a preset operating range that is indicative of a high resistance, the sensor/alarm triggers corrective measures such as shutting down the process until the problems are corrected. See column 13, lines 29-40.

17. The England patent is directed to the electrochemical treatment of a workpiece by electrochemical machining. England discloses that damage can occur if there is direct electrical contact between the workpiece and the machine tool. The current is detected in successive time periods. The maximum value of the current in one period is detected by peak detectors 34, 36 and compared by differential amplifier 42 with the current in an immediately succeeding time period. If the difference exceeds a predetermined threshold value, a relay 48 is operated to disable the machine. It would have been obvious at the time the invention was made to have stopped the process of Frembgen if current was outside the desired range as taught by Hey or England because it would have allowed problems in the process to be corrected and would have averted damage to the workpiece and machine.

18. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Frembgen (US 5,225,053) in view of Manning et al (US 3,635,802).

19. Claim 21 relates to comparing current to a smaller predefined range toward the end of the process. The Manning et al patent is directed to the electrochemical treatment of a workpiece by

anodizing. The anodizing is controlled by a process control computer which stores anodizing current and anodizing time information for carrying out successive steps of the anodizing technique. After each step in the anodizing process a measurement is made, and the anodizing current and anodizing time for the next step are determined. See the abstract. Figure 2 shows the specified tolerance for successive steps. The deviation from a desired value begins at 5 percent and ends at about 0.01 percent. The parameter is adjusted to within a very close tolerance of the nominal value in as short a total time as possible with minimal likelihood of overshooting the tolerance zone associated with the nominal value. See column 2, line 65 to column 2, line 7. It would have been obvious at the time the invention was made to have adjusted the tolerance of the controller of Frembgen as taught by Manning because improved control with a narrower tolerance in the finished product would have been obtained.

20. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Frembgen (US 5,225,053) in view of Osano et al (US 5,503,730).

21. Claim 23 recites the treatment of a plurality of workpieces. The Osano et al patent is directed to the electrochemical treatment of workpieces by anodizing. As shown in figure 1, a plurality of workpieces 100 are simultaneously treated. Each workpiece is provided with an individual current sensor 207. It would have been obvious to have treated more than one workpiece in the process of Frembgen as taught by Osano because greater productivity would have been achieved.



22. Claims 22, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frembgen (US 5,225,053) in view of Altena et al (US 6,214,200).

23. These claims relate to the monitoring of current in a test procedure. The Altena et al patent is directed to the electrochemical treatment of a workpiece by electrochemical machining. Altena recognizes that when setting a small working distance between the processing electrode and the workpiece, short-circuits which may damage the electrode or workpiece may occur. See column 1, lines 36-57. To reduce the likelihood of a short-circuit, Altena increases the distance between the electrode and the workpiece by a first distance and then detects whether the contact between the electrode and the workpiece is broken i.e., whether a short circuit exists. If the detection shows that the contact between the electrode and workpiece has broken, the distance is increased by a second distance. See column 1, line 61 to column 2, line 7. This precludes short-circuiting and substantially reduces the risk of damaging the workpiece or electrode (column 2, lines 28-32). The measurement of detecting contact between the electrode and the workpiece by connecting a current-limited voltage source between the electrode and the workpiece and by monitoring the voltage difference between the electrode and workpiece has the advantage that the presence of contact between the electrode and the workpiece can be detected by simple means. A voltage of between 1 and 3 V has the advantage that it is high enough to minimize noise, but is low enough to preclude dissolving the electrode or workpiece. See column 3, lines 10-22). It would have been obvious to have utilized a test procedure to detect contact between the workpiece and processing electrode in the process of Frembgen using a low test voltage as taught by Altena because damage caused by a short circuit would have been avoided.

24. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Frembgen (US 5,225,053) in view Altena et al (US 6,214,200) or Henri et al US 6,440,291).

25. Claim 27 recites the step of implementing a test procedure using a test voltage. Altena et al is taken as above. The Henri et al patent is directed to the electrochemical treatment of a workpiece by electroplating. An entry voltage is applied to the workpiece prior to immersion in the electrolyte. A detector senses that the entry voltage has passed to a trigger level resulting from the immersion. After the trigger level is sensed electrochemical processing is initiated. See the abstract and figure 1. It would have been obvious at the time the invention as made to have utilized an initial test voltage in the process of Frembgen as taught by Altena or Henri because the test would have avoided damage to the workpiece and electrode, or would have provided confirmation that the workpiece was properly positioned and in contact with the electrolyte solution before the actual processing voltage was applied.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM T. LEADER whose telephone number is (571) 272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William Leader/  
September 29, 2009

/PATRICK RYAN/  
Supervisory Patent Examiner, Art Unit 1795